



Chapter 6

Secondary and Cumulative Effects



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6 Secondary and Cumulative Effects

6.1 Introduction

Chapter 6 addresses potential secondary (indirect) and cumulative effects from the FEIS Preferred Alternative and identifies the effects of the alternatives considered in the DEIS, including the DEIS NEPA Preferred Alternative.

CEQ defines secondary, or indirect, and cumulative impacts in 40 CFR Part 1508.8. In general, secondary impacts are induced by a project but occur later in time or are farther removed in distance than direct impacts. While uncertainties exist regarding the Project's secondary impacts, this FEIS makes a good-faith effort to disclose impacts that are considered reasonably foreseeable [40 CFR Part 1508.8(b)]. Secondary effects can include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems, including ecosystems.

A cumulative impact is an impact on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Changes to This Chapter since Publication of the DEIS

Since the publication of the DEIS, the data on existing conditions have been updated and design refinements have been made to the DEIS NEPA Preferred Alternative. **Section 2.4.3** of this FEIS lists the alternatives considered and the design refinements included in the FEIS Preferred Alternative. For reference, conceptual engineering drawings for the FEIS Preferred Alternative are included in **Appendix E**.

- **Section 6.3** updates and describes the reasonably foreseeable future actions anticipated in the Project Area.
- **Section 6.4** updates and describes the potential secondary and cumulative effects associated with the Project.

6.2 Methodology

The CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500–1508) direct federal agencies to examine secondary and cumulative effects but do not prescribe a specific methodology for analyzing these effects. FTA also has not adopted a specific methodology for analyzing secondary and cumulative effects. Regulations included in the appendix to the Planning Assistance and Standards, 23 CFR Part 450, state that the secondary and cumulative effects analysis should be sufficiently detailed so that consequences of different alternatives can be readily identified, based on current data and reasonable assumptions and based on reliable and defensible analytical methods. Furthermore, courts have mandated that federal agencies take a reasonably “hard look” at projects with regard to available information and analysis of appropriate issues (including secondary and cumulative effects). CEQ requires an assessment of secondary and cumulative impacts in accordance with 40 CFR Parts 1500–1508. CEQ guidance was used to inform the analysis of secondary and cumulative effects for this Project.

6.2.1 Secondary Effects

By providing broader commute options, transit projects have the potential to influence future land use and development decisions, particularly in the areas around proposed stations. Project-induced development can result in secondary, or indirect, effects on the built and natural environments near the Project Area. NICTD used the following methodology to analyze the secondary effects of the FEIS Preferred Alternative compared with the No Build Alternative:

- Identification of the potential for changes in accessibility, such as improvements in travel time, more-direct access, and more transportation options.
- Assessment of the potential for induced growth because of the potential for increased accessibility. Induced growth includes changes to the amount, type, location, and pace of development. Growth around proposed rail stations is often in the form of TOD, which typically consists of dense, walkable, mixed-use development.
- Assessment of the potential for impacts on sensitive resources because of induced growth.
- Identification of potential minimization and mitigation strategies for induced-growth effects.

6.2.1.1 Project Area

The Project Area for secondary effects includes areas that could be affected by land use changes induced by the Project. The National Cooperative Highway Research Program Report 466: *Desk Reference for Estimating Indirect Effects of Proposed Transportation Projects* (NCHRP 2002) states that secondary (indirect) effects from transportation projects typically occur within 0.5 mile of proposed stations. Therefore, this analysis evaluated the potential for secondary effects within a 0.5-mile radius of each proposed station.

As discussed in **Section 4.2**, the three municipal Project stakeholders (Town of Dyer, Town of Munster, and City of Hammond) collaborated with RDA and NICTD to develop TOD plans for the Project station areas. This planning work, which was funded by a grant from FTA's pilot program for TOD planning, integrated land use and transportation planning with the Project. The objective was to design plans that support the investment in transit while respecting local planning and economic development goals. For this reason, the secondary impact analysis for each resource topic assumed that the Project would induce TOD near the proposed stations.

6.2.1.2 Timeframe for Analysis

The potential for the FEIS Preferred Alternative and the No Build Alternative to result in secondary effects was evaluated through 2040, the Project's planning horizon. The regional planning documents of NIRPC and CMAP also extend through the 2040 planning horizon (NIRPC 2011; CMAP 2014c). Past actions are summarized in the existing conditions section of each resource area in **Chapters 3, 4, and 5** of this FEIS and reflect the current state of the resource within the boundaries of this analysis. Present actions are projects by local, state, or federal agencies just completed or under construction, or private development projects known to local jurisdictions.

6.2.2 Cumulative Effects

NICTD used the following methods to analyze cumulative impacts:

- **Existing Conditions and Trends:** NICTD reviewed and analyzed the existing condition of each potentially affected resource, as described in **Chapters 3, 4, and 5** of this FEIS. The assessment of existing conditions for each resource by definition includes the impact of past actions on the condition of the resource. Thus, NICTD focused on understanding the status, viability, and historical context of each resource to determine the relative vulnerability of the resource to cumulative impacts.
- **Project Impacts:** NICTD reviewed and analyzed the potential impacts from the FEIS Preferred Alternative on each resource, as described in **Chapters 3, 4, and 5** of this FEIS. The cumulative analysis relied on the impact determinations in each resource chapter to foresee the status of each resource if the Project were implemented and to understand the Project's contribution to cumulative impacts. The Project impacts, combined with existing conditions and past trends, were used to understand the state of each resource when subject to impacts from other present or reasonably foreseeable future actions.
- **Impacts of Other Actions:** NICTD identified other present actions and reasonably foreseeable future actions (No Build Alternative) and the possible impacts of these actions on each resource. These actions and the process used to identify them are discussed in **Section 6.3**. Potential impacts from each action were identified using a checklist approach to consider each Project Area resource in relation to each action. For example, several of the reasonably foreseeable future actions are residential or commercial development projects. NICTD's understanding of the status of the existing resources (provided in the existing conditions analysis [NICTD 2014]), combined with NICTD's knowledge of the types of impacts typically associated with land development, allowed NICTD to qualitatively describe such impacts. The result is a list of resources that are anticipated to be potentially affected by these actions.
- **Cumulative Impacts:** NICTD identified potential cumulative impacts on to each resource by considering the combination of existing conditions and trends (including past actions), Project impacts, and the impacts of other present actions and reasonably foreseeable future actions. NICTD's professional judgment was used to reach conclusions regarding the potential magnitude of cumulative impacts, taking into account the frequency, duration, magnitude, and extent of potential past, present, and future impacts. The results of the analysis (**Section 6.4**) are generally qualitative, reflecting the available data on other present and future actions. However, the lack of quantification does not prevent the analysis from considering the potential magnitude of an impact and is not considered to limit the value or thoroughness of the analysis.

The geographic Project Area for cumulative impacts is 1 mile on either side of the proposed alignment. This area was selected based on CEQ and USEPA guidance on cumulative impact analysis (CEQ 1997; USEPA 1999) and the Project Area defined for direct impacts. For some topical areas, the cumulative impact Project Area was expanded based on the physical characteristics of the resource, such as air quality, hydrology, or ecological networks.

6.3 Reasonably Foreseeable Future Actions

The planned and programmed actions listed in **Table 6.3-1** are projects and developments currently anticipated through state and local plans, known private development actions, and

planned and funded transportation infrastructure projects within the Project Area through 2040, the Project’s planning horizon. Two development projects, the Centennial Village and Lear Corporation factory, were identified in the portion of the Project Area where new rail infrastructure is proposed. All other development projects identified are located in the Chicago portion of the Project Area where no new rail infrastructure would be constructed. These actions were identified through review of master plans within the Project Area and coordination with local planners and economic development officials.

The analysis includes only major development projects, which include those projects that encompass 10 acres or more, include 25 housing units or more, or are municipal projects for parks, facilities, or new institutions. Transportation infrastructure projects were identified through the TIPs of NIRPC and CMAP. These actions are reasonably foreseeable in that they are likely to occur by virtue of being funded, approved, or part of an officially adopted planning document by the appropriate planning agency within the Project Area.

The FTA Pilot TOD Planning grant updated local jurisdiction plans that encourage more mixed-use, higher-density, pedestrian-friendly land uses in the proposed station areas that are not currently included in the reasonably foreseeable future actions. This planning work was initiated in 2016 and was completed in September 2017.

Table 6.3-1: Reasonably Foreseeable Future Actions

Action	Municipality	Estimated Construction Timing	Description	Potential Environmental Impacts of Action
<i>Land Use Projects</i>				
Centennial Village	Munster, IN	2016–2019	31-acre sustainable, mixed-use, walkable community at Calumet Avenue and 45th Street	Construction, transportation (traffic), economic development, noise
Lear Corporation Factory	Hammond, IN	2017–2020	270,000-square-foot factory north of Michigan Street near Hammond Station; 750 employees	Construction, transportation (traffic), land use, visual and aesthetic resources, noise, water resources
Obama Presidential Library	Chicago, IL	2017–2021	Building containing presidential archives, a museum, and office and program space for the Obama Foundation; proposed to be constructed on about 20 acres of public open space	Construction, transportation (traffic), land use, neighborhood and community resources, water resources, visual and aesthetic resources
Solstice on the Park, 1616 E. 56th Street (Hyde Park)	Chicago, IL	2017–2019	250-unit apartment building	Construction, transportation (traffic), visual and aesthetic resources, water resources



Action	Municipality	Estimated Construction Timing	Description	Potential Environmental Impacts of Action
One Grant Park, 113 E. Roosevelt or 1200 S. Indiana, Central Station Planned Development	Chicago, IL	2017–2019	792-unit mixed-use development	Construction, transportation (traffic), land use, visual and aesthetic resources, noise, water resources
1000M, 1000 S. Michigan	Chicago, IL	2018–2021	323-unit residential condominium tower	Construction, transportation (traffic), land use, visual and aesthetic resources, noise, water resources
Essex on the Park, 808 S. Michigan	Chicago, IL	2017–2019	479-unit mixed-use development and renovation of existing hotel	Construction, transportation (traffic), land use, visual and aesthetic resources, noise, water resources
<i>Transportation Projects</i>				
Construct Pennsy Greenway from Fisher Street at Timrick Drive to Calumet Avenue north of 45th Street	Munster, IN	2020	Construct bicycle and pedestrian facilities	Construction, transportation (bicycle/pedestrian facilities), neighborhood and community resources
Pennsy Greenway Phase 2 (Transportation Enhancement Funds), Main Street to 137th Avenue	Schererville, IN	2018	Construct bicycle and pedestrian facilities	Construction, transportation (bicycle/pedestrian facilities), neighborhood and community resources
Pennsy Greenway Phase 3 from Wilhelm Street at Town Hall to 213th Street	Schererville, IN	2018	Construct bicycle and pedestrian facilities	Construction, transportation (bicycle/pedestrian facilities), neighborhood and community resources
Construct Bicycle/Pedestrian Bridge over Calumet Avenue (U.S. 41) at Conkey Street	Hammond, IN	2019	Construct bicycle/pedestrian bridge for Erie Lackawanna Trail over Calumet Avenue	Construction, transportation, neighborhood and community resources



Action	Municipality	Estimated Construction Timing	Description	Potential Environmental Impacts of Action
Marquette Trail from State St. at Rabin Plaza to Toll Road overpass at Kosciusko Street	Hammond, IN	2021	Construct bicycle and pedestrian facilities	Construction, transportation (bicycle/pedestrian facilities), neighborhood and community resources
Signals at Erie Lackawanna Trail and 150th, Douglas, and 165th Street crossings	Hammond, IN	2018	Install three HAWK pedestrian crossing system	Construction, transportation, neighborhood and community resources
Bicycle/Pedestrian Trail Connector: Erie Lackawanna Trail & Pennsy Greenway at Cady Ditch and Marsh Ditch	Munster, IN	2019	Construct bicycle and pedestrian trail connector	Construction, transportation, neighborhood and community resources, water resources
Install Railroad Protection at Sohl Avenue at IHB Railroad	Hammond, IN	2019	Install railroad protection features (including train-activated warning horns, flashing lights, overhead cantilevers, gates, and constant-warning-time circuitry) to improve transit operations and vehicle safety	Construction, transportation, visual and aesthetic resources, safety and security, noise
Reconstruct SR 312 (Chicago Street)	Hammond, IN	2021	Reconstruct relinquished SR 312 from Indiana-Illinois state line to Marble Street as Phase 1	Construction, transportation, land use, air quality, energy, water resources
Reconstruct 45th Street	Munster, IN	2017-2018	Reconstruct 45th Street on new alignment; includes railroad underpass (from 0.2 mile east of Calumet Avenue)	Construction, transportation, land use, neighborhood and community resources, visual and aesthetic resources, noise, water resources
45th Street Grade Separation Structure	Munster, IN	2017-2018	Construct grade-separation structure (45th Street beneath rail line)	Construction, transportation, safety and security, visual and aesthetic resources



Action	Municipality	Estimated Construction Timing	Description	Potential Environmental Impacts of Action
Millennium Station Additional Track	Chicago, IL	2018–2019	Engineer and construct extra track at Millennium Station boarding platform (NICTD)	Construction, transportation, safety and security
Positive Train Control (PTC)	Various	2018–2019	Implement PTC (NICTD) (computer and satellite system to control spacing and speed of trains)	Transportation, safety and security
Double Track Project (DT-NWI)	Various	2018–2021	Add second track between Gary and Michigan City (NICTD)	Construction, transportation, noise, air quality, water resources
Burnham Greenway	Chicago, IL	Future project	Construct Burnham Greenway from William Powers Conservation Area to Brainard Avenue	Construction, transportation (bicycle/pedestrian facilities), neighborhood and community
I-55 Stevenson Expressway from I-94 to Lake Shore Drive Improvements	Chicago, IL	2016–2020	Reconstruct I-55 Stevenson Expressway road in kind, improve lighting, and make landscape enhancements	Construction, transportation, land use, neighborhood and community resources, visual and aesthetic resources, water resources
Circle Interchange Improvements	Chicago, IL	2016–2021	Add lanes to road; reconfigure bridge; reconstruct road; replace bridge; other improvements	Construction, transportation, noise, air quality

Source: HDR 2017a.

6.4 Potential Secondary and Cumulative Effects

The No Build Alternative includes existing and planned transportation projects that are proposed to exist in 2040 and are included in NIRPC's and CMAP's TIPs, with the exception of the Project. These projects, which primarily involve highway maintenance, roadway widening, and bicycle/pedestrian infrastructure projects, could induce secondary residential and commercial development. Forecasted development would increase roadway traffic volumes, increase motor vehicle emissions and energy use, and potentially affect natural resources such as wetlands and natural habitat.

The following sections describe the potential secondary and cumulative effects of the FEIS Preferred Alternative and other Build Alternatives considered in the DEIS.

6.4.1 Transportation

6.4.1.1 Secondary Effects

FEIS Preferred Alternative

Transportation facilities considered in the secondary effects analysis include transit, roadway, freight, bicycle and pedestrian modes, and parking. Ridership forecasts for the Project show an increase in new transit trips for the FEIS Preferred Alternative compared with existing and No Build conditions, which can be associated with a decrease in auto trips as a result of people switching from auto to transit and projected growth generally in the Project Area. Trips via bicycle and pedestrian modes could increase because a certain number of transit riders would access the proposed stations by foot and/or bicycle.

The attractiveness of transit could also encourage new development that would generate additional demand for transit, automobiles, pedestrian and bicycle modes, and parking. Local land use policies near the proposed commuter rail stations are already in effect and encourage more-compact, localized development that would in turn encourage non-auto travel.

NICTD's receipt of an FTA grant (pilot program for TOD planning) to prepare TOD plans for the Project further refines local plans (see **Section 4.2.3** for more information). Any future development of residential and employment uses around stations could lead to an increase in the number of trips to and from these areas for all modes. This potential change in regional and local travel demand could also increase transit service demand, highway and local traffic volumes, and parking demand.

The proposed North Hammond MSF would be unlikely to induce new development that would substantially increase traffic since it would be located in an industrial-use area near existing rail lines. Therefore, secondary impacts on freight operations are not anticipated.

Other Build Alternatives Considered in the DEIS

Table 6.4-1 summarizes the transportation-related secondary effects of other Build Alternatives considered in the DEIS.

Table 6.4-1: Transportation-Related Secondary Effects of Other Build Alternatives Considered in the DEIS

Alternative ^a	Secondary Effects
CR Alt. Opt. 1-4	Effects similar to those of the FEIS Preferred Alternative. Any impacts associated with the Hammond Gateway Station proposed under the FEIS Preferred Alternative would instead occur at the proposed Downtown Hammond Station.
IHB Alt. Opt. 1-4	North of Sibley Street, induced growth is not expected, since this section would have no stations. As a result, no secondary effects on transportation resources are anticipated. South of Sibley Street, secondary impacts would be similar to those of the FEIS Preferred Alternative.
Hamm. Alt. Opt. 1 and 3	Effects similar to those of the FEIS Preferred Alternative.

Source: HDR 2017a.

^a Shaded areas indicate alternatives evaluated in the DEIS.

6.4.1.2 Cumulative Effects

Continued development and enhancement of the existing transportation network in the Project Area, combined with reasonably foreseeable future actions (non-transportation growth and development) and the direct and secondary effects of the Project, would increase demand for transportation as a whole. Transportation facilities would become more accessible to a greater number of people in the region. Foreseeable future land development, listed in **Table 6.3-1**, would increase the residential and employment populations over time, putting greater pressure on transportation facilities. The nature of past and present auto-centric development patterns would contribute to growth in traffic volumes and congestion on area roads in the future despite the availability of transit. Transit demand would also increase as travelers seek relief from growing roadway congestion and travel delays.

Planned transportation projects, such as the bicycle/pedestrian bridge over Calumet Avenue and the Penny Greenway, would expand the capacity for alternative modes of transportation (i.e., bicycling and pedestrian modes) as well as transit improvements that would support a cumulative increase in transit demand. Future station-area land use planning activities are expected to address needs for enhanced station area pedestrian and bicycle connections in conjunction with future development and redevelopment plans. See **Section 4.2.3** for a description of the RDA-led TOD planning funded under FTA’s pilot program for TOD station-area planning.

Because of the planned transportation improvements, which would generally support the increased demand for transit services in the region, the Project is not anticipated to result in substantial adverse cumulative impacts associated with transportation. Cumulative impacts would be the same for the other Build Alternatives considered in the DEIS.

6.4.1.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on transportation would be mitigated as discussed in **Chapter 3**. Secondary effects would be addressed by developers in coordination with municipalities by applying TOD best practices for traffic, parking, and related issues such as walkability and by following the recommendations of the RDA-led TOD station-area plans. Municipalities would be responsible for reviewing and approving development plans, including assessing traffic and parking impacts, and requiring mitigation as warranted. Therefore, no Project-related mitigation specific to secondary or cumulative impacts is warranted.

6.4.2 Land Use

6.4.2.1 Secondary Effects

FEIS Preferred Alternative

The FEIS Preferred Alternative would enhance access to existing and programmed developments within proposed station areas in the Project Area, including affected sections of the existing Metra/SSL. As a result, the FEIS Preferred Alternative is likely to have a secondary effect on land use in the form of induced development. Local land use policies for areas near commuter rail stations are expected to encourage more-compact regional development.

Local and regional planning efforts support the development of higher-density, walkable development near the proposed stations. If these communities are successful at implementing TOD, such development would likely result in more households and jobs within walking distance of the FEIS Preferred Alternative compared with the No Build Alternative. Additionally, because the density of TOD restricts its development footprint, development of TOD would result in more-sustainable land uses than what would occur under the No Build Alternative.

The proposed North Hammond MSF would be located in an industrial-use area near existing rail lines; it would be unlikely to induce development. However, the nearby Hammond Gateway Station is likely to support new residential development and redevelopment, consistent with local plans, because of the proximity and ability of travelers to walk or bicycle to a commuter rail station.

Other Build Alternatives Considered in the DEIS

Table 6.4-2 summarizes the land use–related secondary effects of other Build Alternatives considered in the DEIS.

Table 6.4-2: Land Use–Related Secondary Effects of Other Build Alternatives Considered in the DEIS

Alternative ^a	Secondary Effects
CR Alt. Opt. 1–4	Effects similar to those of the FEIS Preferred Alternative. Any impacts associated with the Hammond Gateway Station proposed under the FEIS Preferred Alternative would instead occur at the proposed Downtown Hammond Station.
IHB Alt. Opt. 1–4	North of Sibley Street, induced growth is not expected, since this section would have no stations. As a result, no secondary effects on land use are anticipated. South of Sibley Street, secondary impacts would be similar to those of the FEIS Preferred Alternative.
Hamm. Alt. Opt. 1 and 3	Effects similar to those of the FEIS Preferred Alternative.

Source: HDR 2017a.

^a Shaded areas indicate alternatives evaluated in the DEIS.

6.4.2.2 Cumulative Effects

The geographic Project Area for cumulative land use impacts is Lake County, Indiana, and Cook County, Illinois, including the communities of Dyer, Munster, and Hammond, Indiana; and Burnham, Calumet City, and Chicago, Illinois. These communities would be the primary beneficiaries of the Project’s commuter rail services. Because land use changes are generally associated with the increased connectivity between northwest Indiana and downtown Chicago, the regions supporting the places of residence and employment of intended passengers were considered when identifying an appropriate cumulative effects analysis of the Project Area.

Continued development of transit and transportation facilities in the Project Area over time, combined with future actions and the Project’s direct and secondary impacts, could result in land use changes and a redistribution of development or redevelopment in the cumulative effects Project Area. These effects most likely would be in the form of increased residential and commercial densities consistent with TOD. These trends likely would continue until demands for housing and retail, office, and/or industrial space are met.

FEIS Preferred Alternative

The FEIS Preferred Alternative could redistribute development in proposed station areas as described in **Section 6.4.1.1**. There would be no substantive inconsistency or conflict with local land use plans, policies, or regulations. The FEIS Preferred Alternative, in conjunction with past, present, and reasonably foreseeable future development projects, which are derived from the capital planning documents of the regional planning entities, is consistent with regional and local land use plans, policies, and regulations. Therefore, it would be compatible with land use objectives of respective jurisdictions. The RDA-led TOD planning process that was undertaken in coordination with affected communities would update plans and likely allow more TOD development, but it would still be consistent with local plans.

Other Build Alternatives Considered in the DEIS

Table 6.4-3 summarizes the land use–related cumulative effects of other Build Alternatives considered in the DEIS.

Table 6.4-3: Land Use–Related Cumulative Effects of Other Build Alternatives Considered in the DEIS

Alternative ^a	Cumulative Effects
CR Alt. Opt. 1–4	Effects similar to those of the FEIS Preferred Alternative.
IHB Alt. Opt. 1–4	Effects similar to those of the FEIS Preferred Alternative.
Hamm. Alt. Opt. 1 and 3	Effects similar to those of the FEIS Preferred Alternative.

Source: HDR 2017a.

^a Shaded areas indicate alternatives evaluated in the DEIS.

6.4.2.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on land use would be mitigated as discussed in **Section 4.2**. No mitigation specific to secondary or cumulative impacts on land use is warranted.

6.4.3 Land Acquisitions and Displacements

6.4.3.1 Secondary Effects

FEIS Preferred Alternative

The FEIS Preferred Alternative requires property acquisition and displacements that would be predominantly borne by EJ populations. After examining the FEIS Preferred Alternative in its entirety, taking into account the potential adverse effects on EJ populations, committed mitigation measures for each resource area, and anticipated benefits to EJ populations, FTA and NICTD have concluded that the Project would not result in disproportionately high and adverse effects on minority or low-income populations.

As discussed in **Section 6.4.1.1**, the FEIS Preferred Alternative could result in secondary impacts on land uses surrounding the proposed stations. These impacts are associated with the market’s response to investments made from the Project. For example, as the region becomes more attractive to developers because of the increased connectivity between northwest Indiana and downtown Chicago, investment in response to the Project could generate economic development in the region. Incentives to develop residential and commercial properties associated with this economic development could result in acquisitions and displacements. Although these impacts could displace certain homeowners and renters, they would not reduce the availability of housing and business opportunities in the Project Area. Instead, if the Indiana communities are successful at stimulating TOD surrounding the rail stations (as stipulated in local and regional comprehensive plans), a beneficial effect of wider housing choice could occur (typically a feature of TOD).

The proposed North Hammond MSF would be located in an industrial-use area near existing rail lines. It would be unlikely to induce new development that would result in acquisitions, relocations, and/or displacements because zoning changes are not planned in the area.

Other Build Alternatives Considered in the DEIS

Table 6.4-4 summarizes the land acquisitions and displacements–related secondary effects of other Build Alternatives considered in the DEIS.

Table 6.4-4: Land Acquisitions and Displacements–Related Secondary Effects of Other Build Alternatives Considered in the DEIS

Alternative ^a	Secondary Effects
CR Alt. Opt. 1–4	Effects similar to those of the FEIS Preferred Alternative. Any impacts associated with the Hammond Gateway Station proposed under the FEIS Preferred Alternative would instead occur at the proposed Downtown Hammond Station but to a lesser degree. For CR Alt. Opt. 1, 2, and 4, the presence of a maintenance facility could lead to zoning changes with less emphasis on residential uses and more focus on commercial uses.
IHB Alt. Opt. 1–4	North of Sibley Street, induced growth is not expected, since this section would not have stations. As a result, no secondary effects on land acquisitions and displacements are anticipated. South of Sibley Street, secondary impacts would be similar to those of the FEIS Preferred Alternative.
Hamm. Alt. Opt. 1 and 3	Effects similar to those of the FEIS Preferred Alternative.

Source: HDR 2017a.

^a Shaded areas indicate alternatives evaluated in the DEIS.

6.4.3.2 Cumulative Effects

The geographic Project Area for cumulative land acquisition and displacement impacts is the same as the Project Area for cumulative effects for land use impacts, described in **Section 6.4.2.2**. Development of transportation infrastructure in the Project Area, including, for example, the Chicago Street Improvement Project (City of Hammond 2016), combined with the direct and secondary effects of the FEIS Preferred Alternative and other Build Alternatives considered in the DEIS, would result in acquisitions and displacements of residents and/or businesses. In north Hammond, the Project and the adjacent Chicago Street Improvement Project would partially affect the residential area west of Sheffield Avenue. The conversion of residences to transportation uses by both projects would require the displacement of residents, thereby affecting a portion of the neighborhood.

6.4.3.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts of land acquisitions and displacements would be mitigated as discussed in **Sections 4.3, 4.4, and 4.9** (for EJ populations). NICTD and the City of Hammond would coordinate to assess and address the potential cumulative effects of the Project and the Chicago Street Improvement Project on the north Hammond residential area. Strategies identified in **Sections 4.3.5, 4.4.5, and 4.9.4.2** would be considered in conjunction with the affected community.

6.4.4 Socioeconomics and Economic Development

6.4.4.1 Secondary Effects

FEIS Preferred Alternative

The Project would indirectly encourage job and residential growth in northwest Indiana, generally near station areas along the alignment. The RDA-led TOD planning process that was undertaken in coordination with affected communities would support local economic development goals and long-term economic vitality. Future TOD developments would be attractive to people who seek more variety in housing options than what is currently available in the Project Area, people who prefer to use transit, and businesses and services targeting local residents and transit users. This change would be beneficial in terms of supporting local economic development goals and long-term economic vitality.

Despite beneficial effects, redevelopment could increase property values and rents, which can alter the population characteristics of the areas around proposed stations and maintenance facility sites. Low-income people could experience these increases to a greater extent and more likely as an adverse impact, particularly if they rent rather than own property. The proposed North Hammond MSF would be located in an industrial-use area near existing rail lines. It is not expected to induce any changes in land use or zoning that would change socioeconomic or economic development conditions.

Other Build Alternatives Considered in the DEIS

Table 6.4-5 summarizes the socioeconomic and economic development–related secondary effects of other Build Alternatives considered in the DEIS.

Table 6.4-5: Socioeconomics and Economic Development–Related Secondary Effects of Other Build Alternatives Considered in the DEIS

Alternative ^a	Secondary Effects
CR Alt. Opt. 1–4	Effects similar to the FEIS Preferred Alternative. Any impacts associated with the Hammond Gateway Station proposed under the FEIS Preferred Alternative would instead occur at the proposed Downtown Hammond Station but to a lesser degree.
IHB Alt. Opt. 1–4	North of Sibley Street, induced growth is not expected, since this section would have no stations. As a result, no secondary effects on socioeconomic trends or economic vitality are anticipated. South of Sibley Street, secondary impacts would be similar to those described for the FEIS Preferred Alternative.
Hamm. Alt. Opt. 1 and 3	Effects similar to those described for the FEIS Preferred Alternative.

Source: HDR 2017a.

^a Shaded areas indicate alternatives evaluated in the DEIS.

6.4.4.2 Cumulative Effects

The FEIS Preferred Alternative and other Build Alternatives considered in the DEIS, in addition to all of the other projects described in **Table 6.3-1**, have the potential to stimulate temporary construction jobs in the region. These jobs would have a beneficial cumulative impact on people who live and work in the region and on the regional economy. The land use projects listed in

Table 6.3-1 have the potential to stimulate new, permanent jobs associated with proposed retail, commercial, entertainment, and hotel uses. New employment centers, along with greater access to jobs provided by the Project, would provide a beneficial cumulative effect on individual and regional business economic stability. This effect would be amplified by the socioeconomic and economic benefits of the Project as described in **Section 4.4** of this FEIS.

6.4.4.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on socioeconomics and economic development would be mitigated as discussed in **Sections 4.4.5** and **4.9.4.2** of this FEIS for EJ populations. NICTD would coordinate with the Town of Dyer, the Town of Munster, and the City of Hammond to assess and address changes in property values, rents, and the population characteristics around proposed stations and maintenance facility sites. The TOD studies conducted with local communities strived to find the appropriate balance between residential growth and jobs-based development, consistent with the goals of each respective community.

6.4.5 Neighborhoods and Community Resources

6.4.5.1 Secondary Effects

FEIS Preferred Alternative

The use of land for the proposed stations could have a secondary beneficial effect on some neighborhoods. Potential impacts include secondary opportunities for economic revitalization and TOD. The previously noted RDA-led TOD planning activities at proposed station areas would refine these opportunities. The availability of commuter rail service might also induce infill development in existing residential neighborhoods.

Overall, the proposed station locations would provide increased transit service to suburban communities, spurring opportunities for walkable, mixed-use environments to develop. This economic growth could serve as a catalyst for wider redevelopment opportunities in the Project Area that could indirectly strengthen neighborhood cohesion.

Inducement of TOD and infill development around the station areas could have adverse effects on neighborhood growth from increased demand on local infrastructure including water, sewer, roads, and schools to serve new development. However, because such development would be consistent with local land use plans, increased demand for services is expected to be within the capacities of local service providers.

Other potential effects of the proposed stations would be changes to the character of neighborhoods and increases in property values near new stations. For example, increased residential property values associated with proximity to rail stations could preclude some low-income population groups. The RDA-led TOD studies with affected communities that would shape development plans near stations considered impacts on neighborhoods, the availability of affordable housing, and the need for and access to community resources in the formulation of the plans.

The proposed North Hammond MSF would be located in an industrial-use area near existing rail lines; it would be unlikely to induce development. Secondary community resources impacts are not anticipated.

Other Build Alternatives Considered in the DEIS

Table 6.4-6 summarizes the neighborhood and community facilities–related secondary effects of other Build Alternatives considered in the DEIS.

Table 6.4-6: Neighborhood and Community Facilities–Related Secondary Effects of Other Build Alternatives Considered in the DEIS

Alternative ^a	Secondary Effects
CR Alt. Opt. 1–4	Effects similar to those of the FEIS Preferred Alternative. Any impacts associated with the Hammond Gateway Station proposed under the FEIS Preferred Alternative would instead occur at the proposed Downtown Hammond Station but to a lesser degree because of the limited amount of vacant land in the vicinity of Downtown Hammond Station.
IHB Alt. Opt. 1–4	North of Sibley Street, induced growth is not expected, since this section would have no stations. As a result, no secondary effects on neighborhood and community facilities are anticipated. South of Sibley Street, secondary impacts would be similar to those of the FEIS Preferred Alternative.
Hamm. Alt. Opt. 1 and 3	Effects similar to those of the FEIS Preferred Alternative.

Source: HDR 2017a.

^a Shaded areas indicate alternatives evaluated in the DEIS.

6.4.5.2 Cumulative Effects

The geographic Project Area for cumulative neighborhood and community resource impacts is the same as for land use impacts, as described in **Section 6.4.2.2**. Growth and redevelopment by others and the catalytic effect of the Project could result in neighborhood change over the long term. These changes might be beneficial to some and burdensome for others. The primary development forces are local planning and zoning actions that call for development and redevelopment in many parts of the Project Area. The RDA-led TOD studies for proposed station areas considered effects on neighborhood character through increases in the density and mix of land uses. Future redevelopment could be beneficial if it were to enhance visual unity for neighborhoods and communities and was aesthetically pleasing.

The economic benefits of these actions could increase property values and provide additional housing and job opportunities with the improved access to transit. However, increases in property values could also result in increased business expenses (for example, rents) and fewer affordable housing units in the Project Area. In addition, development that would follow the recommendations of station-area TOD plans could create additional demand for community resources such as recreation areas, community centers, and places of worship.

The Burnham Greenway is an 11-mile multiuse trail in the Project Area. The trail is incomplete, forming what is known locally as the Burnham Greenway gap, a 2-mile section where the existing network of railroads, utility lines, and other development pose challenges to completing the greenway. Closing the gap is a reasonably foreseeable project, which would be implemented by others. This project likely would be an elevated structure over the existing IHB/CSX rail lines that would carry the trail and could introduce new visual elements to the Project Area vicinity.

6.4.5.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on neighborhoods and community resources would be mitigated as discussed in **Section 4.5**. TOD and land development management would be addressed in the TOD studies with local communities; ultimately, the responsibility for implementation would be through municipal land use and zoning mechanisms. The TOD plans were a cooperative effort among NICTD, RDA, and the municipalities to shape future development plans near stations to minimize the impact on neighborhoods and consider the need for and access to community resources.

Development of the Burnham Greenway gap project would be subject to local ordinances and development rules. Since the Burnham Greenway gap is not a part of the FEIS Preferred Alternative, no additional mitigation is required.

6.4.6 Cultural Resources

6.4.6.1 Secondary Effects

Under the FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS, development and redevelopment induced by the Project could change land use near historic properties, particularly adjacent to the proposed Downtown Hammond and Hammond Gateway Stations, and the MSF sites. Redevelopment could have direct and secondary effects on historic properties, such as changes to historic property settings caused by incompatible new construction or renovations, demolition, or change in property values. For any development that uses federal funding or requires federal approvals, requirements under federal laws such as NEPA and the NHPA would have to be addressed. In the absence of federal funding, municipalities would be responsible for considering the effects of induced development on cultural resources according to Title 14, Natural and Cultural Resources, of the Indiana Code.

6.4.6.2 Cumulative Effects

The geographic Project Area for cumulative impacts on historic resources included the APE and 1 mile on either side of the Project alignment. Several historic districts and historic buildings and structures of national or local significance are located within the 1-mile buffer of the Project, particularly in Hammond. The setting of these historic resources has been altered over the years with industrial changes, transportation corridor redevelopment, modern infill development, and demolition of several historic buildings and structures.

The Project would have an adverse effect on one cultural resource, as described in **Section 4.6.4**. Other cultural resources are known to be present in the Project Area and vicinity that could be affected by other past, present, and reasonably foreseeable projects. Some properties could be converted or demolished to take advantage of development or redevelopment opportunities.

6.4.6.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on cultural resources would be mitigated as discussed in **Section 4.6**. Future projects with the potential to adversely affect historic resources and which require federal funding or permits would be subject to review under Section 106 of the NHPA, and adverse effects on historic properties would be resolved at that time by the project's sponsor and the appropriate federal agency. State-funded and -authorized projects would be subject to review by

the Indiana or Illinois SHPO, as appropriate. Municipalities are responsible for considering the effects of non-transportation development on cultural resources.

6.4.7 Visual and Aesthetic Resources

6.4.7.1 Secondary Effects

FEIS Preferred Alternative

North of Kensington on the existing MED, the FEIS Preferred Alternative would not change the visual landscape, since no new construction would occur. The potential for secondary TOD development arising as a result of the Project and associated with the proposed Munster/Dyer Main Street, Munster Ridge Road, and South Hammond Stations and parking areas could change the visual character of the residential neighborhoods at these locations from primarily suburban residential to mixed use/commercial. The potential for induced development at the proposed Hammond Gateway Station would be unlikely to change the local character or visual quality in this area, which is already developed with a mix of commercial uses.

The proposed North Hammond MSF would be located in an industrial-use area near existing rail lines. Induced residential or TOD growth around the proposed maintenance facility is unlikely to occur, resulting in no secondary visual impacts.

Other Build Alternatives Considered in the DEIS

Table 6.4-7 summarizes the visual and aesthetic resources–related secondary effects of other Build Alternatives considered in the DEIS.

Table 6.4-7: Visual and Aesthetic Resources–Related Secondary Effects of Other Build Alternatives Considered in the DEIS

Alternative ^a	Secondary Effects
CR Alt. Opt. 1–4	Effects similar to those of the FEIS Preferred Alternative. Any impacts associated with the proposed Downtown Hammond Station are unlikely since this area is already a mix of commercial uses. For CR Alt. Opt. 1, 2, and 4, the presence of a maintenance facility could lead to zoning changes with less emphasis on residential uses and more focus on commercial uses.
IHB Alt. Opt. 1–4	North of Sibley Street, induced growth is not expected, since this section would have no stations. As a result, no secondary effects on visual and aesthetic resources are anticipated. South of Sibley Street, secondary impacts would be similar to those of the FEIS Preferred Alternative.
Hamm. Alt. Opt. 1 and 3	Effects similar to those of the FEIS Preferred Alternative.

Source: HDR 2017a.

^a Shaded areas indicate alternatives evaluated in the DEIS.

6.4.7.2 Cumulative Effects

The geographic Project Area is the area within view of the Project or that would have a view from the Project, and areas near proposed stations and MSF where redevelopment could occur as a result of the Project. As described in **Section 4.7**, the visual environment in the Project Area is commercial, industrial, and residential development.

The existing visual character of the Project Area that was formed by past development would be cumulatively affected by foreseeable projects, including the FEIS Preferred Alternative and other Build Alternatives considered in the DEIS. TOD development around stations would add a new mixed-use visual element to the suburban-style visual character of existing residential areas. The combination of planned developments and the proposed station-area TOD could change views and add new viewers. The changes would be beneficial if the new development were to result in a more visually cohesive area. However; if the new development were out of scale with the surroundings or visually unappealing; then the change would be a negative impact. Approval of such changes occurs through land use planning and design reviews by each municipality, which can encourage aesthetically appealing development.

6.4.7.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on aesthetics and visual resources would be mitigated, as discussed in **Section 4.7.5**. Municipalities are responsible for considering the visual effects of non-transportation development on existing land use. Minimizing the effects of any future development around the proposed station areas on aesthetics and visual resources would also be addressed as a part of the TOD plan development with communities. No mitigation specific to secondary or cumulative impacts on visual and aesthetic resources is warranted.

6.4.8 Safety and Security

6.4.8.1 Secondary Effects

FEIS Preferred Alternative

The FEIS Preferred Alternative could potentially induce TOD, which would result in more-intense uses around the proposed station areas. The increase in residential and commercial use of these areas could increase the need for law enforcement and security providers, particularly where pedestrians and bicyclists would more frequently come into contact with the Project ROW. The proposed North Hammond MSF would be located in an industrial-use area near existing rail lines. Induced development around the facility is unlikely; therefore, no secondary effects are anticipated.

Other Build Alternatives Considered in the DEIS

Table 6.4-8 summarizes the safety and security–related secondary effects of other Build Alternatives considered in the DEIS.

Table 6.4-8: Safety and Security–Related Secondary Effects of Other Build Alternatives Considered in the DEIS

Alternative ^a	Secondary Effects
CR Alt. Opt. 1–4	Effects similar to those of the FEIS Preferred Alternative. Any impacts associated with the proposed Downtown Hammond Station are unlikely since this area is already a mix of commercial uses. For CR Alt. Opt. 1, 2, and 4, the presence of a maintenance facility could lead to zoning changes with less emphasis on residential uses and more focus on commercial uses.
IHB Alt. Opt. 1–4	North of Sibley Street, induced growth is not expected, since this section would have no stations. As a result, no secondary effects on safety and security resources are anticipated. South of Sibley Street, secondary impacts would be similar to those of the FEIS Preferred Alternative.
Hamm. Alt. Opt. 1 and 3	Effects similar to those of the FEIS Preferred Alternative.

Source: HDR 2017a.

^a Shaded areas indicate alternatives evaluated in the DEIS.

6.4.8.2 Cumulative Effects

The geographic Project Area for cumulative safety and security impacts is 1 mile on either side of the Project alignment. Planned transportation improvements and residential and commercial development adjacent to the FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS would put more transit riders, pedestrians, and bicyclists in proximity to transit vehicles, tracks, crossings, and freight rail, potentially creating safety conflicts. This condition could place a cumulative demand on security providers and/or require changes in current patrol routes, schedules, and equipment needs.

6.4.8.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on safety and security would be mitigated as discussed in **Section 4.8**. Safety and security measures to address induced development and reasonably foreseeable projects would be planned for by the local municipalities, Counties, transportation agencies, and emergency service providers. NICTD would expand its existing police force to provide security at and around the stations and throughout the Project Area in cooperation with local law enforcement agencies. Safety and security, including provisions for increased capacity for the NICTD police, would be addressed in the safety and security management plan that would be prepared during the Engineering phase of the Project. Transit rider, pedestrian, and bicycle safety measures would be incorporated into the Engineering phase and maintained and enforced over time. No additional mitigation is required.

6.4.9 Environmental Justice

6.4.9.1 Secondary Effects

FEIS Preferred Alternative

Potential secondary effects on EJ populations could result from increased development and redevelopment in the station areas. Although not every station area is likely to have significant change in the short term, those where demand for new development is stronger would be likely to experience increased property values, corresponding increases in rents and real estate taxes, loss of housing, and displacement of businesses. Although these impacts would be experienced by all populations in the EJ Study Area, low-income people could experience them to a greater extent and, particularly if they rent rather than own property, more likely as an adverse impact.

Conversely, the development of TOD around the proposed stations could have a secondary beneficial effect on EJ neighborhoods by including designated affordable housing in the mix and by providing development space for a variety of businesses and commercial enterprises that support the local community. In such cases, TOD would offer opportunities for economic revitalization in downtown Hammond, benefitting EJ populations with job opportunities and diversity of services. NICTD expects that the TOD studies would address these issues. The adopted plans emanating from this process would be implemented by the respective communities. The result would be development that balances the benefits and effects on EJ populations so as to avoid disproportionately high and adverse impacts.

Overall, the proposed station locations would provide increased access to transit among the Project Area communities, spurring opportunities for walkable, mixed-use environments to develop and indirectly generating potential for access to more jobs and/or higher-paying jobs for EJ populations. Such economic growth, particularly in the more suburban vicinity of South Hammond Station, could serve as a catalyst for redevelopment in a wider geographic area that could also indirectly strengthen EJ neighborhood cohesion. Additionally, as the Project begins service, this could induce infill development in existing residential neighborhoods, strengthening their cohesion.

The proposed North Hammond MSF would be located in an industrial-use area near existing rail lines; it would be unlikely to induce development or affect EJ populations. The addition of a maintenance facility could lead to zoning changes with less emphasis on residential uses and more focus on commercial or light industrial uses. Such future changes could increase property values and result in changes to neighborhood characteristics (such as increased noise levels and changes to the visual character depending on the type of development). If property values, taxes, and rents increase, low-income EJ populations might no longer be able to afford to remain in their neighborhoods or would have fewer housing choices, which could disproportionately affect EJ populations.

Other Build Alternatives Considered in the DEIS

Table 6.4-9 summarizes the EJ-related secondary effects of other Build Alternatives considered in the DEIS.

Table 6.4-9: EJ-related Secondary Effects of Other Build Alternatives Considered in the DEIS

Alternative ^a	Secondary Effects
CR Alt. Opt. 1-4	Effects similar to those of the FEIS Preferred Alternative. For CR Alt. Opt. 1, 2, and 4, the presence of a maintenance facility could lead to zoning changes with less emphasis on residential uses and more focus on commercial uses.
IHB Alt. Opt. 1-4	North of Sibley Street, induced growth is not expected, since this section would have no stations. As a result, no secondary effects on EJ populations are anticipated. South of Sibley Street, secondary impacts would be similar to those of the FEIS Preferred Alternative.
Hamm. Alt. Opt. 1 and 3	Effects similar to those of the FEIS Preferred Alternative.

Source: HDR 2017a.

^a Shaded areas indicate alternatives evaluated in the DEIS.

6.4.9.2 Cumulative Effects

The geographic Project Area for cumulative EJ impacts is the same as the cumulative effects Project Area for land use impacts, as described in **Section 6.4.2.2**. Past and present development projects have influenced where EJ populations live and work in the Project Area, as described in **Section 4.9**. As planned projects proceed throughout the Project Area, including transportation and non-transportation projects, EJ populations could experience beneficial as well as negative effects, such as changes in property values, more housing choices, loss of housing, new business opportunities, displacement of businesses, and increased access to transportation and jobs. Although these effects could be experienced by all populations in the Project Area, low-income EJ populations would be more likely to experience challenges involving increased property values and housing and business impacts. The consideration of means to avoid or minimize and mitigate negative impacts of non-transportation development on all Project Area populations, and particularly EJ populations, is a critical component of successful municipal planning.

Development of planned transportation projects in the Project Area, including the improvements to State Route 312 (Chicago Street), 45th Street, and I-55, combined with the direct and secondary effects of the FEIS Preferred Alternative, could result in cumulative effects on EJ populations where these projects occur, such as changes in zoning, land use, visual character, property values, population, and acquisitions and displacements of residents and/or businesses. In north Hammond, the FEIS Preferred Alternative would be adjacent to the Chicago Street Improvement Project (City of Hammond 2016), where each project would affect the residential area west of Sheffield Avenue. The conversion of residential land uses to transportation uses would displace some residents, which could include EJ populations.

Although some foreseeable future projects would be induced by the Project around stations, most projects are being advanced without influence by the Project. Thus, the Project would have a small, incremental role in potential cumulative effects on EJ populations.

6.4.9.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on EJ communities would be mitigated as discussed in **Section 4.9**. Mitigation proposed for land acquisitions and displacements would also apply to EJ populations, as discussed in **Section 4.3**. The TOD studies considered the effects of non-transportation development on EJ populations in the proposed station areas. As the Project advances, NICTD would continue to consider the Project's role in cumulative effects on EJ populations and would examine means to avoid or minimize and mitigate such effects in coordination with affected communities.

6.4.10 Noise and Vibration

6.4.10.1 Secondary Effects

FEIS Preferred Alternative

The FEIS Preferred Alternative could induce TOD near the proposed stations. Increased residential and commercial activity associated with the higher-density uses typically associated with TOD could increase noise levels around the stations. The proposed North Hammond MSF would be located in an industrial-use area near existing rail lines; it would be unlikely to induce development and, therefore, no noise changes are anticipated. No secondary vibration effects are anticipated.

Other Build Alternatives Considered in the DEIS

Other Build Alternatives could induce land use changes in the area of proposed maintenance facility sites in Munster/Dyer and South Hammond. Increases in commercial uses near residential uses could have secondary noise effects. As with the FEIS Preferred Alternative, the proposed North Hammond MSF would be located in an industrial-use area near existing rail lines; it would be unlikely to induce development and, therefore, no noise changes are anticipated.

6.4.10.2 Cumulative Effects

The geographic Project Area for cumulative noise and vibration impacts includes the area defined by the screening distance of 375 feet from the proposed rail alignments, in accordance with FTA's guidance manual *Transit Noise and Vibration Impact Assessment* (USDOT FTA 2006). If construction of multiple reasonably foreseeable projects were to occur simultaneously, noise levels would likely be temporarily increased. To lessen the possibility that noise levels at sensitive receptors are adversely increased, construction of the Project would be coordinated with nearby projects.

As described in **Sections 5.2** and **5.3**, the FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS have the potential for direct noise and vibration impacts, primarily related to rail operations. Other transportation projects could also have noise and vibration impacts, which would be evaluated by each project sponsor. Where one transportation project is physically close to another, such as where the Project is near Hammond's Chicago

Street Improvement Project in Hammond, the potential exists for cumulative noise and vibration effects to be greater than that of each single project.

6.4.10.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on noise and vibration would be mitigated as discussed in **Sections 5.2** and **5.3**. NICTD and the City of Hammond would coordinate to assess the potential for a cumulative noise and vibration impact attributable to the Project and Chicago Street Improvement Project. Land use developments would be required to comply with the relevant local noise ordinance, which would ensure that nearby receptors would not be exposed to adversely high noise levels.

To avoid adverse cumulative impacts on noise levels during construction, NICTD would coordinate construction with INDOT and local agencies to ensure that construction noise would remain consistent with local requirements.

6.4.11 Air Quality

6.4.11.1 Secondary Effects

With the FEIS Preferred Alternative and other Build Alternatives considered in the DEIS, air pollutant emissions are expected to be lower because people would switch from driving to transit. However, the FEIS Preferred Alternative and other Build Alternatives considered in the DEIS could induce TOD near the proposed stations. Increased residential and commercial activity associated with the high-density uses typically associated with TOD could increase congestion (and thereby air pollutant emissions) at intersections near the stations and result in local, secondary air quality impacts. Construction of induced development could cause temporary adverse air quality impacts related to dust emissions and truck activities.

6.4.11.2 Cumulative Effects

The geographic Project Area for cumulative air quality impacts includes the traffic network within the Project Area for which a qualitative analysis was conducted for the FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS (see **Section 5.4**). Past, present, and reasonably foreseeable projects in the Project Area that would contribute to cumulative human-made air pollutant emissions consist primarily of land developments, building developments, transportation infrastructure upgrades and improvements, and roadway improvements, as summarized in **Table 6.3-1**. The results of the qualitative analysis, reported in **Section 5.4**, indicate that there would be reduced emissions of both criteria pollutants and GHG under the FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS compared with the totals for the No Build Alternative alone. This finding indicates that the Project's role in cumulative air quality effects would be beneficial; it would reduce regional air pollutant emissions.

This reduction would be attributable in part to the decreased VMT as a result of the Project compared with the No Build Alternative. Additionally, as described in **Section 5.4**, neither the FEIS Preferred Alternative nor the other Build Alternatives considered in the DEIS would cause violations of the NAAQS.

6.4.11.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on air quality would be mitigated as discussed in **Section 5.4**. Land use developments would be required to comply with the relevant local ordinances, which would ensure that nearby receptors would not be exposed to adversely high air pollutant emissions.

Construction-induced dust emissions and truck activities would be mitigated using standard BMPs for the Project.

No mitigation specific to secondary or cumulative impacts on air quality is warranted.

6.4.12 Energy

6.4.12.1 Secondary Effects

The FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS are expected to result in travel shifts from single-occupant vehicles to transit. This transition would reduce energy (gasoline) use in the Project Area and the region. Induced TOD around the Project stations would result in increased local electricity demand; however, new TOD is typically required to include energy-efficient design components consistent with contemporary building codes. As a result, a secondary energy impact from future TOD development is not anticipated to occur.

6.4.12.2 Cumulative Effects

The geographic Project Area for cumulative energy impacts includes the traffic network within the Project Area. Past, present, and reasonably foreseeable projects in the Project Area that would contribute to a cumulative increase in energy use consist primarily of land developments, building developments, transportation infrastructure upgrades and improvements, and roadway improvements, as summarized in **Table 6.3-1**. The results of the energy analysis, reported in **Section 5.5**, indicate that cumulative energy consumption including the FEIS Preferred Alternative, other Build Alternatives considered in the DEIS, and No Build Alternative projects would be slightly lower than the totals for the No Build Alternative alone. This finding indicates that the Project's role in cumulative energy use would be beneficial; the Project would reduce energy consumption. This reduction would be attributable in part to the decreased VMT as a result of the Project compared with the No Build Alternative.

6.4.12.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts related to energy would be mitigated as discussed in **Section 5.5**. No mitigation specific to secondary or cumulative impacts on energy is warranted.

6.4.13 Soils, Geologic Resources, and Farmlands

6.4.13.1 Secondary Effects

No secondary impacts on soils or geologic resources are anticipated from the FEIS Preferred Alternative or the other Build Alternatives considered in the DEIS. Three agricultural fields are present within the Project Area west of Munster/Dyer Main Street Station. Since these parcels are located within the municipal boundaries of Munster/Dyer, are not zoned for agricultural use, and are not considered "farmland," there would be no secondary impacts.

6.4.13.2 Cumulative Effects

Reasonably foreseeable projects including the Project would temporarily disturb soils during construction. Deep excavations could locally affect the underlying geology. However, given the site-specific and temporary nature of these impacts, permanent cumulative impacts on soils or geologic resources are not anticipated to occur. In many cases, past and present projects have

converted farmland soils to development for other uses. Remaining farmland soils in the Project Area are designated for development in local land use plans. Development activities occurring on farmland soils would occur primarily within the urban centers of the existing communities or previously developed industrial areas that are incompatible with agricultural activities. The cumulative effect of development of farmland soils is the loss of availability of these soils for agriculture in the Project Area. The Project's role in the loss of farmland soils available for agriculture would be negligible since most of the land NICTD would use for the Project has already been developed for previous transportation or other uses.

6.4.13.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on soils and geologic resources would be mitigated as discussed in **Section 5.6**. No direct impacts on farmlands would occur. No mitigation specific to secondary or cumulative impacts on soils and geology is warranted.

6.4.14 Water Resources

6.4.14.1 Secondary Effects

Surface Waters, Waters of the United States/State, and Coastal Zone Management

The geographic Project Area for the secondary effects assessment of surface waters, waters of the United States/state, and coastal zone management is the same as for land use (**Section 6.4.2**). Most of the Project Area is developed with urban or suburban uses. The proposed Project has the potential to indirectly impact two impaired waterways (Little Calumet River and Grand Calumet River), as well as wetlands and floodplains. NICTD would include BMPs related to erosion control, vegetation, and water quality in the construction documents to minimize the secondary, or indirect, impacts to these resources. In the case of the Project's impacts to wetlands, NICTD assumed that the entire wetland would be impacted when total impacts were equivalent to 50% or greater of the entire wetland area. For those wetlands that would not be entirely impacted, the implementation of BMPs to filter runoff and control releases would help minimize secondary impacts.

Future development encouraged by zoning changes around stations is described in **Section 6.4.2**, along with the announced projects (listed in **Table 6.3-1**) that could be induced by the FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS. Such development would consist of infill mixed-use development around stations and outside sensitive hydrological areas. Nevertheless, such development could negatively affect the quality and quantity of surface waters or wetlands as a result of direct fill, diversion, stormwater runoff, and increased impervious surface area.

Potential future impacts to wetlands from the proposed Project and station-area development could include increased export of pollutants from impervious surfaces and compacted soil, decreased pollutant filtration, increased water temperatures as a result of riparian vegetation removal, and export of pollutants from motor vehicles using "Park-and-Ride" lots and other associated infrastructure. Station area development could indirectly diminish wetland function because of increased pollutant loading from runoff. In the final design of the proposed Project, NICTD would include BMPs to filter runoff and control releases, such as vegetated swales and filter strips. Indirect impacts are less likely if regulatory permit and specified conditions are followed and erosion-control plans are developed.

Commuter rail service would result in decreased regional use of automobiles and more-focused and dense development around transit locations; this decrease in automobile dependency and focused development supports coastal zone management goals. In Indiana, the Coastal Zone Management Program is overseen by INDNR under the State's Lake Michigan Coastal Program. One of the state goals of this program is pollution prevention, which is supported by the expansion of commuter rail service and the resulting decrease in automobile traffic.

In Illinois, the Coastal Zone Management Program is overseen by IDNR as part of the Illinois Coastal Management Program. A primary goal of the program is to promote sustainable development, including reducing carbon footprints. Reducing automobile use and focusing development in primarily urban areas supports sustainable development.

Secondary impacts on coastal zone management areas attributable to increased population that could result from economic development near the proposed stations would be negligible.

Stormwater, Groundwater, Floodplains, and Water Supply

The geographic Project Area for the secondary effects assessment of stormwater, groundwater, floodplains, and water supply is the same as for land use (**Section 6.4.2**). The FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS could result in TOD around the proposed stations. Future development encouraged by zoning changes around stations is described in **Section 6.4.2**, including the announced projects listed in **Table 6.3-1**. Because most of these areas are developed with industrial, commercial, and residential uses, utilities currently exist where development would be most likely to occur. Development would increase demand for water supply and wastewater treatment. Water supply planning is expected to occur prior to development of these areas to ensure adequate water supply and wastewater treatment provision.

Induced development resulting from the Project would increase the amount of impervious surface area compared with the No Build Alternative. With implementation of TOD policies, future development would be likely to occur in a more compact manner near the stations, resulting in less impervious surface compared with current development trends. The relatively small increase in impervious surface would have a commensurately small reduction in permeation and aquifer recharge.

Secondary impacts on stormwater detention could result if development-generated polluted runoff were not appropriately detained and/or treated, as described in the previous section. Secondary impacts on stormwater detention would be minimal because federal, state, and local regulations would require appropriate stormwater detention for new development, along with BMPs to protect water quality.

Secondary impacts on floodplains could result if development occurred in the floodplain or would generate polluted runoff in the watershed of a floodplain. However, federal, state, and local regulations would require appropriate construction practices and compensatory storage for new development, which would minimize potential impacts.

6.4.14.2 Cumulative Effects

Surface Waters, Waters of the United States/State, and Coastal Zone Management

Past projects have affected Project Area surface waters through filling of wetlands, waterway diversion and channelization, and other activities. Reasonably foreseeable projects (listed in **Table 6.3-1**) could further affect surface waters where crossings or adjacent activities are

planned. Land use projects could affect surface waters through fill, diversion, and/or increases in stormwater runoff and impervious surface. Likewise, many of the transportation projects identified in **Table 6.3-1** could have similar direct impacts on surface waters. The cumulative effect of all reasonably foreseeable projects would be a decrease in the total area of surface waters.

Stormwater, Groundwater, Floodplains, and Water Supply

Past projects have affected surface and groundwater quality and quantity by adding pollutants to runoff, directly discharging runoff to waterways and floodplains, and blocking some groundwater recharge with impervious surfaces. Foreseeable projects identified in **Table 6.3-1**, combined with this Project, would add impervious surface area and stormwater runoff, thereby affecting surface and groundwater. All projects together could result in cumulative effects associated with reduced groundwater recharge and increased stormwater runoff on a regional basis. The Project's role in surface and groundwater effects would be incremental and would be addressed through compliance with local stormwater management ordinances, which require implementation of BMPs to reduce impervious surface area and stormwater runoff.

6.4.14.3 Avoidance, Minimization, and/or Mitigation Measures

Surface Waters, Waters of the United States/State, and Coastal Zone Management

The Project's direct impacts on surface waters, waters of the United States/state, and coastal zone management would be mitigated as discussed in **Section 5.7**. Federal, state, and local regulations, including Sections 401 (33 USC § 1341) and 404 (33 USC § 1344) of the CWA and CZMA (16 USC §§ 1451–1464), are applicable to all reasonably foreseeable projects and the FEIS Preferred Alternative and other Build Alternatives considered in the DEIS. Compliance with these requirements by all projects, including coordination with resource agencies as necessary, would minimize secondary and cumulative impacts on the quality or quantity of surface waters and waters of the United States.

Stormwater, Groundwater, Floodplains, and Water Supply

The Project's direct impacts on stormwater, groundwater, floodplains, and water supply would be mitigated as discussed in **Section 5.7**. NICTD would coordinate with the regulatory agencies and local agencies during the Engineering phase of the Project to address surface and groundwater requirements relevant to the Project. Other projects would be subject to federal, state, or local stormwater management and floodplain requirements, as appropriate.

6.4.15 Biological Resources (Wildlife and Habitat and Threatened and Endangered Species)

6.4.15.1 Secondary Effects

The Project Area is primarily a suburban to urban environment, such that additional development near the proposed station and maintenance/layover facility areas is not expected to create secondary impacts on threatened and endangered species, natural areas, or habitat in the more developed portions of the Project Area. The natural areas are far enough away from the FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS such that secondary impacts are not anticipated.

6.4.15.2 Cumulative Effects

Past projects have affected some Project Area natural areas and habitat for common and threatened and endangered species through development of previously undeveloped lands. Reasonably foreseeable land development and transportation projects as identified in **Table 6.3-1** could further affect such areas and state-protected species through proximity or direct land alteration. Impacts from these projects could include direct removal or isolation of habitat areas and introduction of physical barriers such as roads. The Project would have no cumulative effects on threatened and endangered species and generally minimal effects on habitat because most of the Project would be remote from such areas. As stated in **Section 5.8**, land acquisition would affect primarily developed lands or fringe areas inhabited by urban-tolerant species, and minimal impacts on natural areas and habitat would occur.

6.4.15.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on threatened and endangered species would be mitigated as discussed in **Section 5.8**. No mitigation specific to secondary or cumulative impacts on threatened or endangered species is warranted.

6.4.16 Hazardous Materials

6.4.16.1 Secondary Effects

The FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS could induce development and redevelopment around proposed stations, and the MSF site could be negatively affected by potential contamination at hazardous materials sites if federal, state, and local regulations pertaining to hazardous materials handling, storage, and transport are not followed. The presence of contamination could cause concerns for worker safety and might require remediation of contaminated soil or water. This could result in a higher cost of development and/or cause health hazards for workers or future residents. Beneficial impacts would result from the remediation and clean-up of contaminated sites.

6.4.16.2 Cumulative Effects

As indicated by the number of areas of concern identified in **Section 5.9**, past activities have affected some of the Project Area through accidental or deliberate disposal of contaminated or hazardous materials. Many of the reasonably foreseeable projects identified in **Table 6.3-1** would involve excavation as part of the construction process to install below-ground utilities, building footings and foundations, and other typical development elements. These projects, combined with the FEIS Preferred Alternative or the other Build Alternatives considered in the DEIS, could encounter and be negatively affected by contaminated sites and hazardous materials during construction, particularly during the excavation process. The cumulative effect is to potentially expose a larger amount of contaminated or hazardous materials compared with the area of any single project. As a result, worker safety risks could occur as projects are implemented. The Project's role in cumulative effects regarding hazardous materials would be incremental because the Project Area is smaller than the cumulative project area and worker safety is limited to Project activities.

Compliance with hazardous-material regulations would be the responsibility of project sponsors and would be required for all projects, including the creation of spill and containment plans for projects requiring regular handling of hazardous materials. In addition, depending on the nature of contaminated sites listed in the *West Lake Corridor Project Hazardous Materials Technical*

Report in **Appendix G12**, each would be addressed according to applicable regulations (i.e., investigated, treated, contained, and/or cleaned up) as development occurs, which would result in beneficial cumulative effects regarding hazardous materials. Compliance with hazardous-material regulations, as ensured through mitigation monitoring and the development permitting process, would prevent negative cumulative impacts related to hazardous materials.

6.4.16.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on hazardous materials would be mitigated as discussed in **Section 5.9**. Municipalities would be responsible for reviewing and approving development plans, including overseeing appropriate documentation and resolution of hazardous materials issues related to induced development. NICTD, as well as developers and agencies involved in future actions and TOD, would be required to follow all state and federal laws concerning hazardous materials. No mitigation specific to secondary or cumulative impacts on hazardous materials is warranted.

6.4.17 Utilities

6.4.17.1 Secondary Effects

For the FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS, induced development and redevelopment around proposed stations could conflict with utilities, possibly requiring utility relocation during construction. The potential increase in use associated with induced development and redevelopment could require expanded utility capacity and/or new utility services.

6.4.17.2 Cumulative Effects

The potential direct impacts of the Project on utilities are discussed in **Section 5.10**. Additional development and growth in the Project Area associated with the FEIS Preferred Alternative and the other Build Alternatives considered in the DEIS, in combination with the reasonably foreseeable future actions identified in **Table 6.3-1**, would likely result in more demand for electricity compared with the demand from existing land uses, more sewer capacity to accommodate potentially higher water use rates, and increases in the amounts of other utility services required in the Project Area because of a bigger population and/or increased needs resulting from more-intensive land uses.

6.4.17.3 Avoidance, Minimization, and/or Mitigation Measures

Direct impacts on utilities would be mitigated as discussed in **Section 5.10**. NICTD and developers and agencies involved in future actions and TOD would be required to assess and address potential effects on utilities related to their projects in coordination with utility owners. No mitigation specific to secondary or cumulative impacts on utilities is warranted.